



Nova Scotia

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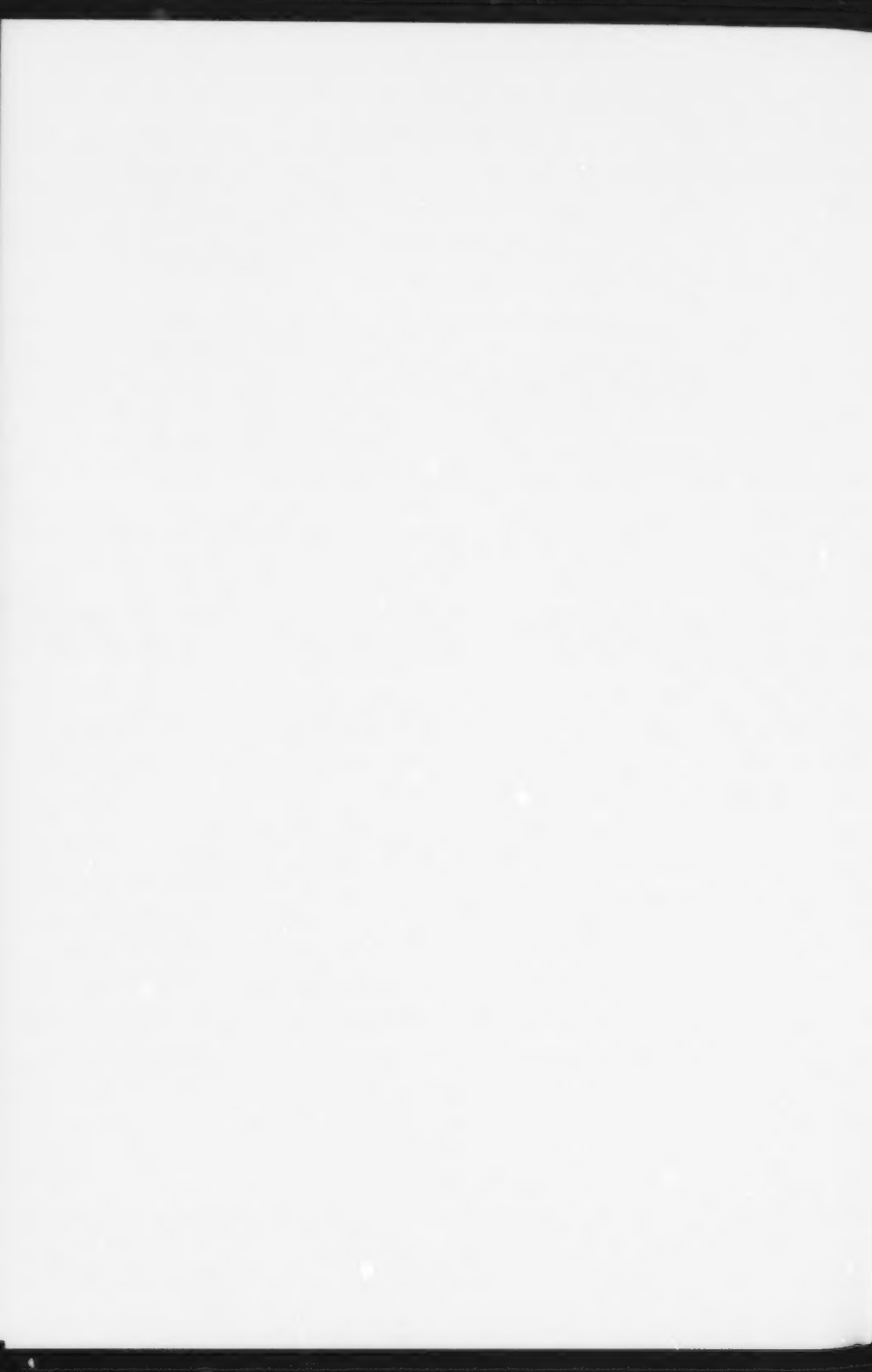
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ANNUAL REPORT

*for the fiscal year
ending March 31, 1989*

**Department of
Fisheries**



To His Honour
The Honourable Lloyd R. Crouse, P.C.
Lieutenant-Governor of Nova Scotia

May It Please Your Honour:

I have the honour to submit herewith the twenty-fifth Annual Report
of the Department of Fisheries, for the fiscal year ending March 31, 1989.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Donald P. McInnes". The signature is fluid and cursive, with a long horizontal stroke at the end.

Donald P. McInnes
Minister of Fisheries

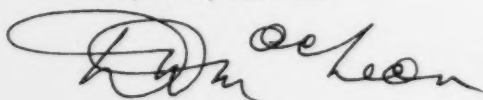


To The Honourable Donald P. McInnes
Minister of Fisheries

Sir:

I have the honour to submit the twenty-fifth Annual Report of the
Department of Fisheries, for the fiscal year ending March 31, 1989.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "D.A. MacLean". The signature is fluid and cursive, with a large loop at the beginning and a long, sweeping tail.

D.A. MacLean
Deputy Minister



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Organizational Chart Department of Fisheries



THE FISHING INDUSTRY

Total landings of commercial marine species in Nova Scotia decreased slightly in 1988-89.

Fishermen in the province landed 522,366 metric tons of fish, shellfish, and marine plants in 1988, representing a 6 per cent increase over the 1987 catch of 493,371 metric tons. The landed value of all species decreased 17 per cent to a value of \$437 million from \$524.2 million in 1987.

Lobster again placed first in terms of being the most valuable species in 1988, worth \$141.1 million to fishermen. Cod was second with a landed value of \$81.9 million, while scallops provided nearly \$74 million to fishermen in that sector of the industry.

The groundfish sector of the fishery posted a decrease in landings of 6 per cent. The shellfish, as well as the pelagic and estuarial sectors showed increases in weight of 5 per cent and 22 per cent respectively in 1988.

INDUSTRIAL DEVELOPMENT

The Industrial Development Division administers two major programs.

1. The Development Program:

- provides cost-sharing incentives for industry to upgrade fishing vessels, harbor infrastructure, shore-based facilities, and processing plants with proven technology;
- supports development and demonstration projects as a means of introducing new and/or improved technology to the industry;
- provides engineering services to other divisions of the department.

2. The Inspection Program:

- administers the Fish Inspection and Fish Buyers Regulations.

The activities of the division are organized and conducted under the following program areas or budget categories.

TECHNOLOGY DEVELOPMENT

Fishing Vessel and Gear

The department completed a joint project with the Technical University of Nova Scotia (TUNS) to measure and evaluate hull forms representative of inshore fishing vessels used in the province. A report was submitted at the conclusion of the fiscal year and was evaluated by staff.

Test fishing was conducted off Lunenburg County to determine if herring spawned on kelp in that area. Roe on kelp is considered a delicacy in parts of the world, particularly Japan. The department completed preliminary investigations. Further tests may be conducted in the Northumberland Strait in 1989-90.

Working in cooperation with a local manufacturer and a fisherman from Antigonish County, the division developed an aluminum deck, with a removable hatch system. The aim of the project was to demonstrate the suitability of aluminum in marine applications and to incorporate various features that are not prevalent in existing decks. Stability analyses of the boat were conducted before and after the installation of the deck. The vessel should be in operation during the 1989-90 fiscal year and will be evaluated at that time.

The division conducted a joint study with a local processor to evaluate the soft shell clam industry and the feasibility of establishing a depuration facility. Results proved encouraging and the processor is considering constructing a facility to handle clam production in southwestern Nova Scotia.

Shore-Based Facilities

The technical staff continued to provide comprehensive guidelines and consultation services on construction practices for many of the shore-based incentive programs such as bait-freezing and storage facilities. On-site supervision by the division's engineers is often necessary, and they are assisted as required by engineering students hired under various employment programs.

Several projects were undertaken to address problems in the processing sector. The technical staff assisted a company to develop a handling, packing, and transporting system capable of processing high volumes of herring carcasses destined for the pet food market in Britain. The system worked reasonably well, although it was not tested to capacity due to low landings of herring. The equipment will be used next year and, it is hoped, will make a major contribution toward the development of a viable pet food market for herring carcasses.

The division continued to work on the development of a fish sauce, made by adding an enzyme to herring and maintaining the mixture at a constant temperature for several months. The resulting liquid can be used as a food sauce or in food preparations. Demand for such a product has come from oriental communities in North America. The project was conducted in conjunction with a private company, which plans to use the information in deciding whether to proceed with commercial production of the product or not.

The division funded a one-week demonstration of an Icelandic machine that splits cod heads in preparation for salting. An established market exists for this product in Italy and indications are that new suppliers are required. The project was conducted in an operating fish plant, and industry representatives from nearby plants were invited to observe the machine in operation. Cod heads, which represent approximately 10 per cent of the round weight of the fish, are normally discarded.

Fish Products and Processing

The department continued to examine ways of increasing the utilization of fish waste, particularly herring carcasses resulting from the roe fishery. Working in cooperation with the Agriculture Canada Experimental Station in Kentville, various experiments were carried out to evaluate the use of fish silage as a fertilizer. Silage was used in a grape vineyard in Bear River and on a commercial strawberry farm in Church Point. Studies were also undertaken in Kentville to evaluate protein and hull development on various grain crops treated with a fish-based foliage spray. Experimental mixtures of fish silage and chicken offal were developed at a plant where poultry discards are processed into animal feed.

The division continued work on a joint project with the Department of Lands and Forests, which consisted of spraying Christmas trees and softwood stands with fish silage. The effects of the spray on bud proliferation and tree color are being evaluated.

Tests were carried out on the use of high-fat herring silage as feed for ruminants (sheep and cattle) at the Agriculture Canada Station in Nappan. The division co-financed the study. While no conclusive results were obtained, similar trials conducted on young feeder pigs by the Nova Scotia Department of Agriculture and Marketing in Truro did produce positive results in terms of growth performance. Fisheries staff also evaluated the results of an experiment involving the low-cost storage of roe herring carcasses in saturated salt brine. After seven months of this type of storage, the carcasses were still suitable for making bloaters (heavily smoked whole herring).

Various development projects using departmental processing equipment were undertaken throughout the province. These include mussel processing in Alder Point; processing of rock crab in Cape Forchu and River John; and the deboning and production of minced fish from salt fish frames in the Yarmouth area. The department also worked on a joint project with the St. Francis Xavier University food laboratory and Scotsburn Dairies to produce crab dips and related dairy-based products from the currently unused rock crab resource of the province.

A local processor was assisted in the development of a new canned herring product, which opened new market opportunities in the Far East. Additional development work on dogfish, another under-utilized species, focused on the smoking of backs and belly flaps.

FINANCIAL INCENTIVES

Harvesting

During the 1988-89 fiscal year, the number of applicants requesting financial assistance under the division's Safety and Quality Improvement Program increased significantly. A total of 403 applications were processed.

The division assisted 183 individuals to purchase approved inflatable life rafts, 62 applicants to acquire halon fire fighting systems, and 135 fishermen to purchase insulated polyethylene fish handling containers.

Under the Safety and Efficiency Program, eight vessels were equipped with propeller nozzles. The same number of vessels were equipped with hydraulic net reels.

Onshore Facilities

Harbor infrastructure was upgraded in many parts of Nova Scotia. Three areas of major interest were fishermen's gear sheds, private wharves, and public boat ramps. The department assessed 170 applications; 68 were approved and completed. Technical and financial assistance was provided for 39 private fishing wharves; 15 gear shed buildings, providing gear and work space for 94 fishermen; and 14 public boat ramps.

About \$350,000 was allocated to the private wharf program to cost-share the purchase of construction materials. The wharves were designed and constructed under departmental direction and with the assistance of technical staff.

The province provided \$282,000 as a cost-sharing arrangement for the construction of fishermen's gear sheds. These were built as community buildings and divided into individual units for storing and maintaining fishing gear.

Public slipways were completed at 14 locations to be used by fishermen and aquaculturists. The slipway program totalled \$128,000. Fishermen and fishermen's groups coordinated or constructed the projects; departmental engineers and technicians evaluated the designs and sites.

Processing

This program area addressed the issues of fish quality and operational efficiency as they pertain to processors, fishermen, and aquaculturists. Projects included refrigerated storage, plant cleaning equipment, heat pump saltfish dryers, vacuum packaging equipment, and mussel grading machines. A total of 74 applicants received \$487,000 in cost-sharing assistance under the program.

Funding was provided for nine cool/cold storage projects and 19 bait/trawl freezing facilities. Written guidelines and technical assistance ensured that the buildings were properly constructed.

The division assisted five processors to install heat pump dryers and two processors to purchase vacuum packaging equipment.

Thirty processors received cost-sharing assistance for the purchase of steam/high pressure cleaners used to clean working areas and fish processing equipment.

The aquaculture industry is expanding and some operators require mechanical equipment for declumping and grading shellfish products. Six companies received assistance to purchase these machines.

FISHERIES INSPECTION SERVICES

The department is responsible for administering the Nova Scotia Fish Inspection Regulations. It is also responsible for enforcing the Nova Scotia Fish Buyers Regulations, as well as the Aquaculture Act and Regulations.

The department's inspection service acquired three full-time inspectors during the fiscal year 1988-89. The addition of these positions will enable the department to take a more active role in matters affecting the health and safety of Nova Scotia consumers. Over 50 site inspections were completed during the year.

ECONOMIC REGIONAL DEVELOPMENT AGREEMENT— FISHERIES

The Fisheries Subsidiary Agreement between Canada and Nova Scotia was signed in October 1984. The agreement has a total value of \$50 million over five years. Federal and provincial expenditures will amount

to \$35 million and \$15 million respectively. The program and budget structure are as follows:

Five-Year Budget (\$000,000)

Sector	Federal	Provincial
Quality Enhancement	21.0	1.5
Efficiency Improvement	10.5	6.0
Market Improvement	0.5	2.0
Resource Enhancement	1.5	5.0
Public Information, Evaluation and Administration	1.5	0.5
Total	35.0	15.0

Funding for the agreement was approved in August 1985 in an interim amount of \$28.5 million (\$20 million federal contribution, \$8.5 million provincial) for the period 1985-86 to 1988-89. The agreement terminated as of March 31, 1989.

Provincial projects are selected on the basis of the following criteria and order of priority:

1. Development—Generic Projects

These include marketing and aquaculture development projects that result in products or processes of benefit to the industry as a whole (e.g., utilization of waste products).

2. Development—Company-Specific Projects

These projects involve research and development that is of primary benefit to a specific company (e.g., a new seafood product).

3. Technology Transfer

Technology developed elsewhere or in another sector is evaluated for use in Nova Scotia's fishing industry.

4. Training Programs

These programs include the cost of providing training for new initiatives (e.g., dockside grading).

5. Public Facilities

This category includes government-owned infrastructures (e.g., hatcheries).

6. Incentive Projects

Cost-sharing grants are given to encourage further use of equipment, facilities, or processes proved effective to achieve specific objectives in the province (e.g., equipment related to quality improvement).

The programs and projects that were approved and completed during the 1988-89 fiscal year are listed below. The provincial budget for the period was \$2.5 million; the federal budget was \$5.8 million.

	Primary Responsibility	
	Federal	Province
Quality Enhancement		
Ice-making and storage	•	
Electricity and water to processors	•	
Vessel fishhold upgrading	•	
Scallop roe testing		•
Clam industry testing		•
Listeria workshop		•
Efficiency Improvement		
Fishermen's gear shed construction		•
Herring roe evaluation		•
Skidways and haul-outs	•	•
Development of aluminum hulls for Atlantic fishery	•	
Market Development		
(Cost-shared by Nova Scotia and the federal Department of Fisheries and Oceans)		
Publication: <i>The How-To Book of Seafood Cooking</i>		
Publication: <i>Microwave Cooking</i>		
Publication: <i>Lobster</i>		
Publication: <i>June Is Seafood Month</i>		
Publication: <i>Discover Seafood</i>		
Family restaurant recipe development		
Market analysis of saltfish (provincial funds only)		

	Primary Responsibility	
	Federal	Provincial
Resource Enhancement		
Public involvement—education		•
Mussel sleeving methods		•
Therapeutic agent for sea lice		•
Environmental monitoring program for mussel growers		•
Monitoring loss of cultured mussels to birds		•
Growth of giant scallop juveniles		•
Fisheries Centre of Excellence	•	•
Aquaculture Demonstration Centre		•
Frasers Mills Hatchery		•
Silver hake fishery development	•	•
Heated salmonid fish pen		•
Public information, evaluation and administration	•	•

FISHERIES LOAN BOARD

During the 1988-89 fiscal year the Board registered the highest number of approved loans since 1983. At the same time, the number of accounts and the amount of money in arrears continued to decrease dramatically. As of March 31, 1989, principal arrears amounted to \$775,338 on 214 accounts.

Eight meetings were held during the year. Of the 378 applications considered, 222 were approved, 67 rejected, and 89 returned to the applicants for various reasons. A further 18 loans already in existence were assumed by other applicants.

Gross value of approved loans totalled \$21,279,630. After downpayments were deducted, total net loans amounted to \$16,829,212, an amount which is very close to that of the previous year. There were 229 loans paid off during the year.

The following table compares Loan Board activity over the past five fiscal years:

Year Ending Mar. 31	Applications Received	Loans Approved	Net Amount Approved	Outstanding Loans	Amount Outstanding
1985	263	121	3,972,682	1,966	84,994,445
1986	240	109	6,267,295	1,774	74,068,949
1987	237	105	5,670,410	1,555	62,450,835
1988	362	216	16,863,941	1,454	59,520,867
1989	378	222	16,829,212	1,337	62,833,952

In addition to the outstanding loans of \$62,833,952 at year-end, there were outstanding commitments of \$1,995,962. Advances during the year amounted to \$15,078,732. Repayments on the principal totalled \$10,202,690, and a further \$4,930,073 was received on interest. Write-offs amounted to \$1,612,658.

A breakdown of the types of loans approved is as follows:

	Number of Loans	Amount of Loans
New boats to 39'11"	83	\$ 3,543,820.24
New boats 40' to 43'11"	27	2,090,585.84
New boats 44' to 44'11"	18	3,869,322.40
New boats 45' to 64'11"	14	5,008,000.00
Used boats to 39'11"	9	200,000.00
Used boats 40' to 43'11"	1	140,000.00
Used boats 45' to 64'11"	3	900,000.00
Diesel engines	43	617,725.57
Gas engines	1	4,928.00
Equipment	13	108,003.14
Upgrading	8	329,647.20
Aquaculture	2	17,180.00
	<u>222</u>	<u>\$16,829,212.39</u>

Loans approved, by county, were as follows:

	Number of Loans	Amount of Loans
Annapolis	14	\$3,469,768.40
Antigonish	22	506,782.35
Cape Breton	27	1,316,937.52
Colchester	1	28,000.00
Cumberland	3	111,763.60
Digby	16	1,801,013.81
Guysborough	1	9,240.00
Halifax	19	1,450,096.31
Inverness	8	329,463.88
Kings	1	28,000.00
Lunenburg	7	584,668.80
Pictou	21	517,506.27
Queens	11	1,030,893.20
Richmond	7	352,979.82
Shelburne	21	2,586,043.60
Victoria	19	572,688.60
Yarmouth	24	2,133,366.22
	<u>222</u>	<u>\$16,829,212.39</u>

Thirty-six loans, in an amount of \$4,119,830, were cancelled.

TECHNICAL AND INSPECTION SERVICES

During the 1988-89 fiscal year, 138 boats were completed with Loan Board financing. Technical services were provided during the preliminary planning and construction stages of these boats. Inspectors made 426 progress inspections on 153 vessels. At the end of the fiscal year, 15 of these boats were at various stages of construction and subject to further inspection. In addition, 73 used boats were inspected; 62 boats were inspected for engine and equipment loans; 8 boats were upgraded; and 382 boats were inspected for maintenance and housekeeping. Twenty-two sea trials were held. Twenty new boat shops and fibreglass molds were added to the Loan Board's approved list.

TRAINING AND FIELD SERVICE

TRAINING

There continues to be a strong demand for courses in net and gear technology, engineering, navigation, and safety, and the demand for programs comes from both the inshore and offshore fleets. The programs for the offshore fleets are comprised mainly of navigation and engineering courses, which prepare the candidates to write for Transport Canada Certification. While there is no current regulation for transport certification within the inshore fleet, there is considerable interest in the safety and navigation training programs that lead to certification as Fishing Master IV.

The training programs were conducted at the School of Fisheries, Pictou, and in 59 locations throughout the province.

A summary of the training offered by the Training and Field Services Division is as follows:

	Inshore	Offshore	Processing
Navigation	Small Craft Master Fishing Master Class IV	Fishing Master I Fishing Master II Fishing Master III	
Engineering	Small Gas & Diesel Diesel Engines Hydraulics	Watchkeeping Engineer Fishing Vessel Chief Engineer Fourth Class Engineer	Refrigeration for: Small Plant Operator Assistant to Plant Engineer
Fishing Gear Technology	Basic Skills in Repair and Construction Advanced Construction & Maintenance	Deckhand Trawlerman	
Safety	Marine Emergency Duties A2 Fire Fighting Life Saving, Survival First Aid	Marine Emergency Duties B1 & B2 Life Saving, Survival First Aid	
Small Business Management	Family Business Recordkeeping Taxation Financial Decision Making		Small Plant Operator Recordkeeping Finance Management

	Inshore	Offshore	Processing
Aquaculture	Business Plans Site Selecting Shell Fish Farming Fin Fish Farming		
Quality Control	Care of Catch Dockside Grading	Care of Catch	Quality Management
Advisory Services	Fishing Gear & Engineering	Design of Special Programs	Design of Special Programs

Nova Scotia School of Fisheries

The programs offered at the Nova Scotia School of Fisheries are designed primarily to meet the needs of the offshore fleet. The school serves the needs of the local area and is used also for custom-designed programs for clients from overseas and other areas of Canada.

Nova Scotia—Offshore

Course	Number Held	Students Completed
Navigation	8	75
Marine Emergency Duties	8	75
Chief Engineer	1	10
Radio Telephone	8	75

Transport Canada Certification Programs: School and Extension

Course	Number Held	Number of Fishermen Passed
Fishing Master Class I	2	29
Fishing Master Class II	2	18
Fishing Master Class III	3	36
Fishing Master Class IV	15	178
Marine Emergency Duties (M.E.D)	15	178

Extension Programs in Fishing Communities

The Extension Programs are designed primarily to meet the training needs of the inshore harvesting sector. The planning and coordination of these programs in the fishing communities is facilitated through the work of the department's fishery representatives working in cooperation with officials from Canada Employment and Immigration. Partial funding for the courses, both at the school and for the extension programs, is provided through CEIC training funds.

A strong emphasis has been, and continues to be, placed on safety programs, which include:

- First Aid
- Fire Fighting
- Life Saving and Survival
- Use of Survival Suits and Life Rafts
- Distress Signals

The following communities were served with training programs in 1989-89:

Drumhead	Northport
Alder Point	Glance Bay
Church Point	Pubnico
Bay St. Lawrence	North Sydney
Pubnico	Tracadie
Kentville	Shelburne
Barrington	Dayspring
Lunenburg	Pugwash
Terence Bay	Port Dufferin
River John	Petit de Grat
Cheticamp	Weymouth
Annapolis Royal	Canso
Wallace	Northport
Dingwall	Sandy Cove
Garbarus	Prospect
Chezzetcook	Ingonish
Neils Harbour	Eastern Passage

The breakdown of the training programs conducted in these fishing communities is as follows:

Course	Number of Courses	Students Completed
Navigation	15	178
F/M Class IV—Phase I Loran "C"	14	168
Inshore Fishing Operations	10	120
Marine Emergency Duties (M.E.D.)	15	178
Small Gas and Diesel	4	40
Deckhand/Trawlerman	2	24
Radio Telephone	15	178
First Aid	15	178

Contract Training

The department entered into training contracts with the following agencies:

- Department of Fisheries and Oceans
- Department of Energy, Mines and Resources
- National Sea Products
- Canadian International Development Agency (CIDA)
- International Centre for Ocean Development (ICOD)

The programs for each agency are custom-designed to meet their needs.

	Number of Courses	Number of Students	Duration
Federal Fisheries and Oceans			
Navigation	2	23	5 days
Department of Energy, Mines and Resources			
Energy Conservation	35	450	1 day
Overseas—Uruguay (National Sea)			
Pre-entry Seamanship	1	6	10 days
International Centre for Ocean Development*			
Gill Net Construction and Repair			
Longlining			
Outboard Engine—Maintenance & Repair			
Small Boat Safety & Navigation			

Recordkeeping			
Fisheries Cooperatives			
Training-the-Trainer	1	20	30 days

**Canadian International Development
Agency***

Same program as ICOD	1	27	30 days
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*The ICOD and CIDA programs were designed for students from Grenada, St. Vincent, Antigua/Barbuda, British Virgin Islands, St. Kitts, Nevis, and Dominica.

Aquaculture

Training programs were developed for aquaculture operators. However due to a lack of demand no courses were conducted. A series of 8- to 10-week courses will be offered in 1989-90 through Canada Employment and Immigration (CEIC) funding.

FIELD SERVICE

The fisheries representatives serve fishing communities and industry throughout the province by providing information and monitoring the service of government programs in the areas of Industrial Development, Loan Board, Aquaculture, Marketing, and Training.

During 1988-89 training programs for Nova Scotian fishermen at the School of Fisheries in Pictou and in fishing communities throughout the province were coordinated by the Field Service and Administration staff. The Field Service Division worked in consultation with Transport Canada and the Canada Employment and Immigration Commission in processing documents related to training and arranging instruction facilities. The division also played a major role in the selection of students.

Applications to the Industrial Development Division for assistance, described elsewhere in this report, were taken by the fisheries representatives and rated according to impact and priority in the industry. Several hundred applications were handled and progress on approved projects was monitored.

Confidential reports on loan applications were completed by the Field Service for the Fisheries Loan Board. Assistance was given to fishermen in finding boatbuilders or used boats. Another significant function of the representatives involved supplying financial advice and

additional loan information. Fishermen were also encouraged to bring their loans up to date.

Aquaculture received increased emphasis from all members of the Field Service. More attention is expected to be given to both fin fish and shellfish rearing in the future as the Aquaculture Act and Regulations are promoted and enforced.

The fisheries representatives continued to service the fishing industry by monitoring and reporting on the wide range of programs and services of the federal Department of Fisheries and Oceans. In addition, the representatives are heavily involved with the federal Department of Transport on navigational aids and fishermen's certification papers; the provincial Department of the Environment on dump sites; the provincial Department of Lands and Forests on land use; Canada Employment and Immigration on training registration and student selection; the federal Department of Communications on radio licences.

A key role for all fishery representatives is to act in an advisory capacity to the fishermen and processors in their region as the latter seek to understand the wide range of government regulations, programs, and services. This function is carried out through attendance at numerous meetings of fishermen's groups and on a one-to-one basis.

The management structure of the Field Service Division was changed this year with the appointment of two of the existing representatives as managers of Southwest Nova Scotia and Eastern Nova Scotia/Cape Breton. This change has served to enhance the quality of the service and improve communications between the department and the numerous agencies affecting the fishing industry.

MARINE RESOURCES DIVISION

The Marine Resources Division represents the department and the fishing industry of the province on numerous government-industry advisory committees. Its function is to ensure that the needs of the industry are adequately considered in the development and implementation of management plans for the various fisheries in which provincial fishermen participate.

This year the division was represented on 50 official advisory committees dealing with groundfish, pelagics, scallops, marine plants, clams, and crustaceans. The division advised on many bilateral agreement discussions with foreign nations.

The division also represented the department on five offshore oil and gas committees. The Division Director is co-chairman of the joint Nova Scotia-Canada Fisheries Advisory Committee as provided for in the Canada-Nova Scotia Offshore Petroleum Resources Accord. Through the oil and gas committees, the department ensures minimal interference with the fishing industry as a result of offshore exploration and development. It interacts directly with the Canadian Oil and Gas Lands Administration, along with other federal and provincial departments involved in authorizing offshore activity.

RESOURCE MANAGEMENT AND RESEARCH

The Resource Management and Research section of the division is divided into three units, each dealing with a species group: groundfish, invertebrates, and pelagic fish. A marine advisor heads each of the units and is responsible for providing expertise concerning management of the particular resource. The marine advisors for the invertebrate and pelagic species are also involved in research programs aimed at investigating species and stocks of specific interest to Nova Scotia. These studies are important for improving present management and for developing future fisheries. The programs involve considerable field work for which students are employed. Details of these studies are described below.

Invertebrates

In 1988, the division participated in programs aimed at collecting information on lobster and crabs in fishing ports around the province. Biological data on size frequencies, catch effort, and reproductive potentials were gathered and will be used to assess the fisheries as they exist and to

project how they may be developed in the future. Division staff focused on lobster area 26 (formerly district 7bl.), initiating a program aimed at increasing the lobster size. Over the next few years, the legal size of lobster in Inverness County will go from 2.5 to 2.75 inches. This change is expected to increase the yield from the local fishery and potentially increase recruitment. Throughout the years, the department has encouraged and supported fishermen by providing new lobster measures and assessing the impact of such changes on the lobster fishery. The division continued to work with the Department of Fisheries and Oceans on lobster tagging studies to assess the growth and movement of lobsters in the experimental area.

Pelagic Fish

With the herring fishery becoming increasingly dependent on roe production, departmental studies were initiated to assess fish handling procedures and biological factors on roe quality and yield. In addition, a roe brining technique was examined as an alternative to the typical procedure of freezing roe for shipment to Japan.

Departmental studies on the gaspereau stock in the Pictou Harbour region have provided biological information on habitat alteration and gaspereau production. In 1988, the gaspereau population was examined using data about the composition of the species, size and age frequency, and the movement of spawning fish into the Middle River Reservoir. The early life history of gaspereau was investigated through samplings showing the density, distribution, and growth of larvae and juveniles. Plankton production in the reservoir was also studied in relation to environmental factors.

AQUACULTURE AND INLAND FISHERIES

This division is responsible for the planning, implementation, and administration of policies and programs aimed at conserving and enhancing the fisheries resource where land and water meet. Major responsibilities include:

- 1) Administration of the Aquaculture Act and Regulations, under which aquaculture licenses and leases are issued, and of the Federal-Provincial Agreement on Aquaculture Development, which provides for coordination of departmental responsibilities and programs for the orderly development of this resource sector. A Federal-Provincial Industry Sector Committee, composed of representatives from all regions, species culture sectors, and the Aquaculture Association of Nova Scotia, assists the two levels of government by providing ongoing advice and by developing a long-term Aquaculture Development Plan for the province's aquaculture research sector.
- 2) Management of the recreational trout fishery, which includes producing and distributing 1.2 million trout to some 220 rural and urban lakes across the province and conducting lake and stream surveys, creel censuses, and other field and extension work, which support the conservation and enhancement of the recreational trout fishery.
- 3) Providing departmental advice and technical expertise to provincial and federal agencies, intergovernmental committees, and the public involved in the management of the resource base in the coastal zone.
- 4) Administering and directing the implementation of applied research and development projects that support aquaculture development. These initiatives are carried out through the Federal-Provincial Regional Economic Regional Agreement (fisheries sector).
- 5) Providing extension services to the public in the aquaculture and inland fisheries resource sectors through resource material, demonstration sites, on-site project evaluations, and public seminars and workshops.

The divisional headquarters are maintained at the Fisheries School in Pictou, while the Aquaculture Coordinator and licensing and leasing administration staff are based in the Halifax office. Regional operational facilities include an experimental shellfish hatchery and shellfish culture demonstration site at Pleasant Point (Halifax County) and trout produc-

tion facilities at Frasers Mills (Antigonish County) and McGowan Lake (Queens County).

AQUACULTURE DEVELOPMENT

This section provides field and extension support to people applying for aquaculture licenses and leases, as well as to operators. Services include site evaluations, water quality surveys, technical advice on culture methods, and the provision and sale of hatchery, finfish, and shellfish stock for start-up operations.

This year the division received 64 new applications for molluscan aquaculture leases, licenses, and experimental permits. Initial water quality analyses were conducted on 18 areas.

Other services included conducting preliminary site inspections, providing technical advice and information, transferring aquaculture technology, and selling shellfish seed stock. A total of 80,000 native seed oysters and 500 seeded mussel collectors were sold to private operators during 1988-89. Temperature recorders were also provided on loan to operators.

Aquaculture operations reported total production sales of \$2,336,717 and employed 223 full-time and part-time people.

The division continued to promote aquaculture development through seminars and workshops which were held throughout the province.

Research and Development

Research and development aimed at improving molluscan shellfish hatchery production techniques continued at the Pleasant Point hatchery. Staff focused on the following species: native oyster, bar clam, razor clam, soft shell clam, and moon snail.

Other areas of research included investigating hatchery and nursery methods, testing certain species under winter conditions, researching new species for aquaculture applications, and broodstock management.

The division evaluated the Ship Harbour area as a possible location for the new provincial Aquaculture Demonstration Centre.

Publications

- Report #11
Identification of Potential Sea Scallop Culture Sites in the Nearshore Waters of Nova Scotia
By MacLaren Plansearch Ltd.
- Report #13
Within and Among Site Variation in Bay Scallop Production
By Andre Mallet, Claire Carver
- Report #14
A Therapeutic Agent for Sea Lice
By Roland Cusack
- Report #15
A Bio-economic Assessment of Grow-out Methods for Mussel Culture
By Mallet Research Services
- Report #16
Environmental Monitoring for Commercial Mussel Growers
By Acadia University
- Report #17
Reduction of Loss of Cultured Mussels to Birds
By the Aquaculture Association of Nova Scotia
- Report #18
Comparative Growth of Giant Sea Scallop Juveniles
By Michael J. Dadswell
- Report #20
Enhancing the Environment for Oyster Culture with Rip-Rap: A Preliminary Assessment
By Adrian J. Desbarats

Finfish Aquaculture

In providing extension services to finfish aquaculturists, department staff visited 60 sites between May and December 1988. Ten emergency visits were made in response to fishkills primarily during the summer. Again this year, Dr. Robin MacKelvie was available to finfish aquaculturists for matters concerning fish health.

Staff answered 350 inquiries for information on aquaculture.

On November 8, 1988, the department conducted an intensive workshop on salmonid triploidy/sex reversal technology at its Frasers Mills Hatchery. Dr. Arnie Sutterlin from the Bay d'Espoir hatchery in Newfoundland led the day-long session, which was attended by 19 hatchery operators and staff. The sessions were videotaped and are available to interested parties.

The department again offered its salmonid broodstock spawning service to the aquaculture industry. This year, private facilities were able to accommodate egg production, thereby eliminating the need to use departmental facilities for this operation. As the industry matures, it is expected to become self-sufficient in other areas as well.

The department sold its St. Peter's hatchery to a private company, which will supply seedstock to aquaculturists. The department will continue to supply quality salmonid eggs. In this capacity, it sold approximately 0.75 million rainbow trout eggs and 0.25 million speckled trout eggs to private sites. It is interesting to note that many operators, formerly serviced by the department, are now having their orders filled by private hatcheries. Department sales dropped to about 75,000 rainbow and speckled trout, which were sold to 100 sites.

INLAND FISHERIES

Production and Distribution

The department's new McGowan Lake hatchery came into full production in 1988. Future production plans at the McGowan Lake and Frasers Mills hatcheries include greater emphasis on seatrout, brown trout, and several varieties of hybrid speckled trout in order to serve the needs of the diverse fisheries throughout the province.

Recreational Fishery Management

A breakdown of the department's activities for the recreational fishery in 1988-89 is as follows.

A total of 306 lakes were stocked, 155 as part of the department's Urban Recreational Angling Program, and 151 as part of its Wild Replenishment Program. While the number of stocked lakes increased by 30 per cent over 1987, the quantity of fish placed in these lakes

decreased by 8 per cent for a total of 682,400 fish. This decline can be attributed to the privatization of the St. Peter's hatchery, the discontinuation of trout production by the federal government hatcheries, and drought conditions in 1987 that forced the early release of some fish that normally would have been held over to 1988.

About 300,000 fish were used in the Urban Recreational Angling Program, and 380,000 in the Wild Replenishment Program. Some 14,200 rainbow trout were placed in provincial lakes. In addition, the division expanded its seatrout program and released 26,000 of these fish in 1988.

A breakdown of the stocking activity is as follows:

	Spring	Fall	1988 Total
Frasers Mills			
Speckled	167,865	153,437	321,302
Seatrout	8,040	12,100	20,140
Rainbow	14,245	0	14,245
McGowan Lake			
Speckled	105,675	213,000	318,675
Seatrout	0	6,000	6,000
Rainbow	2,000	0	2,000
TOTAL	297,825	384,537	682,362

This division continued to work closely with many local fish and game clubs throughout the province. About 600,000 speckled trout hybrid eggs were supplied to volunteers for planting in artificial redds. As well, another 400,000 speckled trout hybrid swimup fry were incubated in streamside units for stream enhancement work. The department expects an equally successful year of cooperation with these organizations in 1989-90.

In 1988, 35,000 catch-size trout were supplied to 23 fishing derbies. Requests for fish for these sporting activities are increasing, and it has become necessary to impose restrictions on the timing of the events. The trout used for the derbies are part of the Urban Recreational Angling Program, and the public is permitted to fish on these lakes at any time during the fishing season.

Extension Services

Publications provided through the Extension Services include the *Trout Education Program* and the *Adopt-A-Stream Manual*.

Trout Education Package

The *What Do Trout Eat?* poster and slide show were produced and are available from the department's Pictou office.

An *Invertebrate Sampling Kit*, which includes an instruction manual and field equipment, was prepared. Kits are available to the public from the Pictou office.

Adopt-A-Stream Program

The department responded to 19 inquiries concerning this program. As a result of these inquiries, four volunteer organizations have selected project sites and begun activities.

MARKETING

The Marketing division provides a wide range of services to the fishing industry, the seafood retail sector, the foodservice industry, and the general public. Support services offered by the division are aimed at promoting seafood to improve sales in local, national, and international markets.

MARKET DEVELOPMENT AND PROMOTION

General

The aim of this service is to provide comprehensive and timely information to the Nova Scotia fishing industry on seafood market opportunities worldwide and to ensure that information on Nova Scotia seafood exporters and products is available internationally. Staff also assist in the promotion of Nova Scotia seafood within and outside the province. During the year, the Marketing Division responded to 1,400 requests for information and distributed 620,000 pieces of promotional material.

Trade Issues

Staff provided input and background papers on issues concerning the European Economic Community (EEC) tariff structure, the Multi-level Trade Negotiations (MTN) discussions, and the General Agreement on Tariffs and Trade (GATT) ruling on West Coast herring and salmon. Position papers were prepared in conjunction with other provincial departments. The division monitored developments in trade actions by the United States against seafood products, as well as regulatory changes related to customs and inspections.

Seafood Publications

Two new publications were printed: *The How-To Book of Seafood Cooking* and *Seafood Barbeque*. These, as well as other promotional materials, were distributed to consumers, educators, retailers, and foodservice operators throughout Canada and the United States. The materials are provided in quantity to Nova Scotia seafood retailers and wholesalers to support their sales efforts. About 480,000 recipe pamphlets, posters, and kits were distributed.

The *Directory of Nova Scotia Fish Products* and the *Retail Outlets* pamphlet are updated annually. The directory is a buyers' guide for

seafood produced in the province and is distributed internationally. The *Retail Outlets* pamphlet lists the many outlets within the province where consumers can purchase fresh and frozen seafood.

Seafood Trade Shows

The division participated in three seafood shows in the United States: Boston Seafood Show '88, Sea Fare '88 in Los Angeles, and the New York Seafood Show. The Nova Scotia booth provided information on the quality and types of seafood produced in the province. Provincial staff assisted Nova Scotia exhibitors by helping them with the design and set-up of their booths and providing booth hardware and samplings of Nova Scotia seafood products. Two departmental seafood consultants also provided individuals assistance to these companies. The number of exhibitors at the Boston Seafood Show has increased considerably, and the show offers favorable opportunities to make contacts with major American markets, along with key markets in Europe and the Pacific rim.

Promotions—In Province

The department conducted seafood cooking demonstrations at exhibitions, shopping malls, and consumer shows, including the Atlantic Winter Fair and Food Fair Atlantic, Kid's World, and food extravaganzas. These promotions are aimed at increasing consumer awareness of Nova Scotia seafood. The electronic and print media also proved valuable for disseminating seafood information, especially through radio shows and the publication of articles and seafood recipes. Retailing workshops were conducted for major supermarket chains planning to expand their seafood merchandising efforts.

June—Seafood Month

June was chosen for special promotional activities because seafood is readily available and reasonably priced at this time of the year. Retailers and foodservice operators favor the summer for emphasizing seafood.

For the second year, promotions for Seafood Month were launched with a cook-off in Amherst featuring teams from each of the Maritime Provinces. Other activities included sporting events, the CBC Information Morning Birthday Party, radio interviews, and seafood demonstrations.

Training

This ongoing program, aimed at training food sales staff about Nova Scotia seafood and how to increase the sales and profits of the seafood counter, was offered to retail stores during 1988-89.

The division also provided training programs to the kitchen staff of institutions. The program focused on improved techniques for preparing seafood that can save time and are efficient when preparing large quantities of food.

One-day seminars for foodservice operators were offered by the department through the Tourism and Hospitality Institute of Nova Scotia.

ADMINISTRATIVE SERVICES

This division provides administrative support to the department including financial, personnel, and office services. Planning, economic, statistical, data processing, and communications services are also provided as required.

Some of the major projects undertaken by the division during the year are described below.

Fisheries General Policy

An updated edition of the 1980 Fisheries General Policy document was completed. The policy document acts as a blueprint for the general direction of the department's programs. The Nova Scotia fishery generates close to \$1 billion annually for the provincial economy and the updated policy is designed to lead the industry into the 1990s.

Aquaculture Statistics

Under the terms and conditions of the Federal-Provincial Agreement on Aquaculture Development, the department is responsible for collecting aquaculture production statistics. In 1988, aquaculture production exceeded 690 metric tonnes worth in excess of \$2 million.

Administrative Information and Control Systems

During the year, efforts commenced on updating the department's Long Range Systems Plan for the next five years. Expected to be completed early in the next fiscal year, the plan details proposed computer acquisitions and systems development.

The Fisheries Loans System, now residing on the IBM mainframe at the Provincial Data Centre, has proven to be far superior to the previous HP-250 based system. The system is now being fine-tuned to reduce monthly charges from the Department of Government Services, but without losing the integrity of the database or the flexibility of the system.

The Plant Registration and Fish Buyers Licence System was completed and data entry will commence early in the next fiscal year in preparation for licence renewals. In addition, the application tracking portion of the Aquaculture Management System was completed and the Trout Management System was enhanced. Hardware for the Incentive

Grants System and the Training System was ordered and is expected early in the new year. Priority will be given to these two systems in the next fiscal year.

Weatheradio Canada

The department and Environment Canada continued to cost-share this service, a highly successful series of VHF radio stations in Nova Scotia and Prince Edward Island. The service disseminates marine and public weather information.

Fishery Exhibitions

During the year, the department was represented at the Nova Scotia Fisheries Exhibition in Lunenburg, the Atlantic Fisheries Trade Show in Yarmouth, the Fundy Fisheries Fall Exhibition in Digby, and at a conference for the Eastern Shore's small business sector in Musquodoboit Harbour. The department will present a joint display with the Department of Industry, Trade and Technology at the second International Fisheries Equipment Exposition to be held in Halifax, early in the next fiscal year.

STATISTICAL REVIEW

All fisheries production statistics given here for the calendar year 1988 are revised figures supplied through the courtesy of the federal Department of Fisheries and Oceans. They may be subject to minor adjustments as late returns from firms and individuals are received and processed in that department.

TABLE I
Major Species Landings Yielding
over \$1 Million Annually

Species ^a	Landings (Metric Tons)		Value (\$,000)	
	1988	1987	1988	1987
1. Lobsters	18.602	18.423	141,124	160,341
2. Cod	129.931	132.493	81,883	120,747
3. Scallops	68.325	66.295	73,942	83,463
4. Haddock	25.528	23.801	26,323	32,212
5. Herring	124.178	98.392	20,603	18,868
6. Pollock	40.087	42.261	13,966	23,534
7. Flounders	14.617	16.928	13,768	16,316
8. Redfish	32.839	34.220	12,173	11,286
9. Halibut	2.096	1.776	9,614	9,580
10. Crabs	3.075	2.581	9,241	7,396
11. Shrimp	2.682	2.578	8,531	7,328
12. Swordfish	972	948	6,041	6,685
13. Clams	4.167	2.614	4,149	2,208
14. Hake	9.783	15.245	3,684	11,390
15. Tuna	346	—	3,450	— ^b
16. Mackerel	6.451	5.242	2,247	1,821
17. Alewives	5.217	—	2,090	— ^b
18. Cusk	2.935	3.949	1,454	3,519
19. Monkfish	1.438	—	1,190	— ^b
20. Rockweed	23.939	—	945	— ^b

^aListed in descending order of value in 1988.

^bAdditional species yielding over \$1 million in 1988.

TABLE II
Nova Scotia Fisheries
Landed and Marketed Value
1955-1988

Year	Landed Value (in \$,000)	Marketed Value (in \$,000)
1955	23,582	47,093
1960	26,094	51,753
1965	49,371	93,443
1970	55,652	105,939
1975	91,010	208,574
1980	230,911	438,799
1981	263,727	484,182
1982	259,411	523,191
1983	276,451	497,664
1984	265,335	533,500
1985	312,733	562,919
1986	423,973	805,548
1987	524,147	995,800
1988	439,079	834,250 ^a

^aThis is an estimate based upon recent average past relationships between landed and marketed values.

TABLE III
Nova Scotia Fisheries
Landings and Landed Value
by Species Group

Group	Landings (Metric Tons)		Value (\$,000)	
	1988	1987	1988	1987
Groundfish	260,837	275,024	164,637	232,051
Pelagic & estuarial	137,574	108,117	35,367	29,411
Molluscs & crustaceans	97,128	92,797	237,448	261,653
Miscellaneous ^a	26,827	17,433	1,630	1,032
Total	522,366	493,371	437,082	524,147

^aSeaweeds, worms, tongues, roes, unspecified

TABLE IV
Landed Value of Fisheries by County

County ^a	Landed Value ^b (\$,000)		Change (Per Cent) 1987-88
	1988	1987	
Shelburne	84,806	112,009	-24
Lunenburg	67,771	93,045	-27
Yarmouth	61,409	64,912	- 5
Digby	55,547	50,804	+ 9
Cape Breton	43,575	54,316	-20
Guysborough	32,155	30,540	+ 5
Inverness	20,596	22,062	- 7
Halifax	16,408	25,760	-36
Queens	13,073	21,885	-40
Victoria	12,081	13,156	- 8
Pictou	9,390	10,585	-11
Richmond	7,118	7,909	-10
Cumberland	6,247	6,639	- 6
Antigonish	4,874	5,206	- 6
Annapolis	1,690	1,803	- 6
Colchester	1,311	2,214	-41
Kings	907	1,207	-25
Hants	121	97	+25
Total	439,079	524,149	-16

^aCounties are in order of the 1988 landed value.

^bLanded value includes groundfish, pelagic and estuarial, molluscs and crustaceans, viscera, seaweed, and other.

TABLE V
Total Landed Weight of Fisheries by County

County ^a	Landed Weight ^b (Metric Tons)		Change (Per Cent) 1987-88
	1988	1987	
Yarmouth	94,375	62,409	+51
Lunenburg	88,590	98,004	-10
Shelburne	76,954	78,744	-2
Digby	69,242	58,896	+18
Guysborough	56,844	50,342	+13
Cape Breton	53,095	57,357	-8
Inverness	19,665	16,161	+22
Richmond	13,852	13,443	+3
Halifax	12,277	16,711	-27
Queens	12,054	15,503	-22
Pictou	10,010	9,824	+2
Victoria	8,275	7,584	+9
Antigonish	2,661	3,850	-31
Cumberland	1,515	1,636	-7
Annapolis	1,437	759	+89
Colchester	900	1,201	-25
Kings	499	763	-35
Hants	131	184	-29
Total	522,376	493,371	+6

^aCounties are in order of the 1988 landed weight.

^bLanded weight includes groundfish, pelagic and estuarial, molluscs and crustaceans, viscera, seaweed, and other.

TABLE VI
Landed Weight and Landed Value of Fisheries
by Species Group by County
(1988-1989)

County	Species Group ^a	Landed Weight (Metric Tons)		Landed Value (\$,000)	
		1988	1987	1988	1987
Annapolis	Groundfish	153	189	127	255
	Pelagic	—	4	—	1
	Shellfish	880	566	1,550	1,547
	Other	403	—	13	—
Antigonish	Groundfish	482	1,178	217	767
	Pelagic	1,382	2,050	467	605
	Shellfish	797	622	4,189	3,834
	Other	—	—	—	—
Cape Breton	Groundfish	42,451	51,302	24,235	39,508
	Pelagic	3,634	2,998	618	754
	Shellfish	7,009	3,057	18,718	4,054
	Other	1	—	4	—
Colchester	Groundfish	14	26	16	29
	Pelagic	57	37	88	37
	Shellfish	829	1,138	1,207	2,148
	Other	—	—	—	—
Cumberland	Groundfish	—	4	—	7
	Pelagic	84	332	65	128
	Shellfish	1,431	1,300	6,182	6,504
	Other	—	—	—	—
Digby	Groundfish	16,035	16,508	11,223	18,411
	Pelagic	19,991	26,152	3,411	4,971
	Shellfish	29,488	15,457	40,787	27,399
	Other	3,727	779	125	23
Guysborough	Groundfish	44,305	39,273	19,945	20,708
	Pelagic	9,220	8,818	1,577	1,595
	Shellfish	3,318	2,251	10,632	8,237
	Other	—	—	—	—

TABLE VI, Continued

County	Species Group ^a	Landed Weight (Metric Tons)		Landed Value (\$,000)	
		1988	1987	1988	1987
Halifax	Groundfish	9,844	13,421	9,906	16,691
	Pelagic	1,458	1,972	2,189	2,362
	Shellfish	969	1,318	4,314	6,707
	Other	—	—	—	—
Hants	Groundfish	8	4	9	5
	Pelagic	120	160	109	58
	Shellfish	3	20	4	34
	Other	—	—	—	—
Inverness	Groundfish	13,262	13,037	5,790	10,433
	Pelagic	3,204	350	1,621	144
	Shellfish	3,199	2,774	13,185	11,485
	Other	—	—	—	—
Kings	Groundfish	287	262	392	415
	Pelagic	143	449	86	304
	Shellfish	69	52	429	488
	Other	—	—	—	—
Lunenburg	Groundfish	53,553	55,618	28,676	36,007
	Pelagic	3,226	2,350	1,120	547
	Shellfish	31,808	40,036	37,973	56,490
	Other	2	—	2	—
Pictou	Groundfish	111	173	58	118
	Pelagic	8,257	8,084	1,527	1,916
	Shellfish	1,536	1,509	7,788	8,542
	Other	106	58	19	9
Queens	Groundfish	7,286	8,695	5,689	8,641
	Pelagic	1,436	322	527	483
	Shellfish	3,332	6,486	6,857	12,757
	Other	—	—	—	—

TABLE VI, Continued

County	Species Group ^a	Landed Weight (Metric Tons)		Landed Value (\$,000)	
		1988	1987	1988	1987
Richmond	Groundfish	12,746	12,475	4,740	5,100
	Pelagic	736	598	265	250
	Shellfish	370	370	2,113	2,559
	Other	—	—	—	—
Shelburne	Groundfish	42,392	47,013	40,201	57,424
	Pelagic	14,077	10,957	8,589	6,579
	Shellfish	4,139	5,263	34,933	47,221
	Other	16,346	15,511	1,083	785
Victoria	Groundfish	4,496	5,092	3,020	5,253
	Pelagic	2,269	1,244	861	438
	Shellfish	1,509	1,248	8,201	7,465
	Other	—	—	—	—
Yarmouth	Groundfish	13,412	10,754	10,393	12,279
	Pelagic	68,280	41,240	12,247	8,239
	Shellfish	6,442	9,330	38,386	44,182
	Other	6,242	1,085	384	212

^a"Pelagic" includes pelagic and estuarial.

"Shellfish" includes molluscs and crustaceans.

"Other" includes livers, tongues, scales, roe and oil, sea plants, mammals, worms.

TABLE VII
Atlantic Provinces Landings and Landed Value—1988

Province	Landed Weight (Metric Tons)	Landed Value ('000)
Nova Scotia	522,371	439,079
Newfoundland	551,028	299,720 ^a
New Brunswick	149,706	116,014 ^a
Prince Edward Island	39,430	64,939 ^a

^aPreliminary figures

TABLE VIII
Nova Scotia Fishery Profile

Employment (1988-89)

Fishermen	13,296
Plant workers—yearly average	9,000
Registered fish processing establishments	357

**The Nova Scotia Fishing Fleet—
by Size and Vessel Categories (1988-89)**

Inshore Fleet (Length/ft)	Number of Boats
Less than 20'	966
20'-24.9'	395
25'-29.9' & 30'-34.9'	1,655
35'-39.9'	1,031
40'-44.9'	815

Total	4,862
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Nearshore Fleet (Length/ft)	
45'-49.9'	29
50'-54.9'	23
55'-59.9'	40
60'-64.9'	124

Total	216
-------	-----

Offshore Fleet (Length/ft)	
65'-89.9'	8
90'-99.9'	33
100'-124.9'	50
125'-149.9'	21
150'+	24

Total	136
-------	-----

Total of Boats All Sizes	5,214
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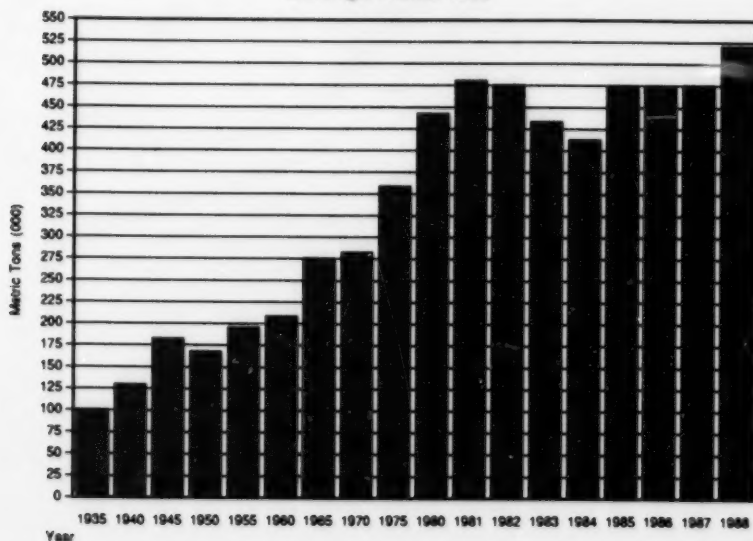
**DEPARTMENT OF FISHERIES
ORDINARY EXPENDITURES**

Fiscal Year Ending March 31	Total Ordinary Expenditure
1965	\$ 230,787
1966	340,653
1967	321,742
1968	530,166
1969	412,577
1970	458,034
1971	1,020,778
1972	1,373,784
1973	908,457
1974	3,138,359 ^a
1975	1,088,534
1976	661,763
1977	2,350,456
1978	3,149,131
1979	5,377,213
1980	5,841,649
1981	11,047,135 ^b
1982	13,758,223
1983	12,642,688
1984	10,891,506
1985	11,496,630
1986	9,482,968
1987	7,964,297
1988	8,926,000
1989	9,207,436

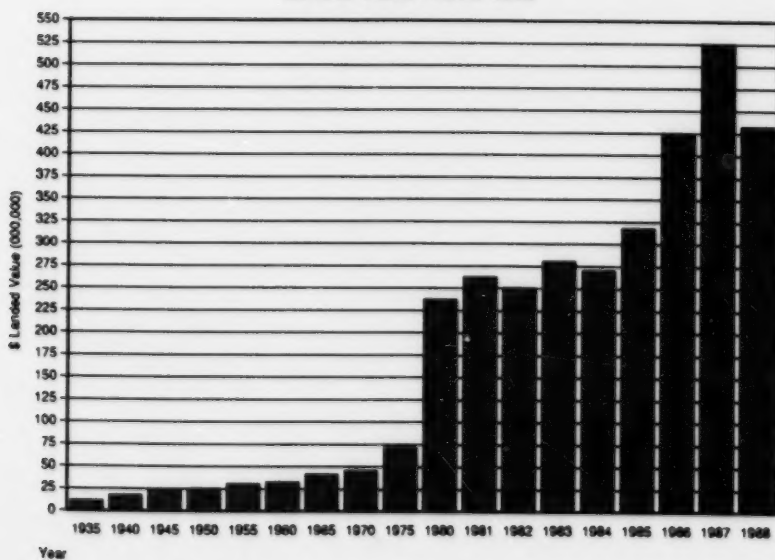
^aMore than \$2 million was spent in the form of special assistance to help the industry recover from a storm in June 1973.

^bBeginning in 1981, capital advance interest charges for the Fisheries Loan Board are included in the Department of Fisheries estimates. These charges were previously accounted for under Department of Finance estimates.

**Nova Scotia
Landings Profile 1988**



**Nova Scotia
Landed Value Profile 1988**



DEPARTMENT OF FISHERIES

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 485-4525—Pictou
 485-5056—Pictou
 Telex 019-22799—Halifax

Minister	Hon. Donald P. McInnes	Halifax
Secretary to the Minister	Mrs. Sharon Grandy	Halifax
Deputy Minister	David (Sandy) MacLean	Halifax
Secretary to the Deputy Minister	Miss Mary Evans	Halifax

Finance & Administration Division

Director	John Marsters	Halifax
Supervisor, Administrative Services	Charles Allen	Halifax
Personnel/Payroll Clerk	Ms. Cathy MacDonald	Halifax
Accounting Clerk	Mrs. Nancy Wallace	Halifax
Clerk 3	Miss Sandy Kane	Halifax
Clerk Receptionist	Ms. Veronica Van Derdonk	Halifax
Supply Technician	Frank MacKay	Pictou
Public Information Officer	Ms. Diane Kenny	Halifax
Computer Services Officer	Ken Weston	Halifax

Marketing Division

Director	Ms. Janis Raymond	Halifax
Secretary to the Director	Ms. Judy Ganner	Halifax
Seafood Consultant	Mrs. Estelle Bryant	Halifax
Home Economist	Ms. Ellen O'Reilly	Halifax

Marine Resources Division

Director	Art Longard	Halifax
Administrative Assistant	Ms. Beverly Comeau	Halifax
Advisor, Marine Resources (Crustaceans)	Greg Roach	Halifax
Advisor, Marine Resources (Groundfish/Plants)	Peter Underwood	Halifax
Advisor, Marine Resources (Pelagic)	Bob Crawford	Antigonish

Aquaculture and Inland Fisheries

Director	Linc MacLeod	Pictou
Secretary to the Director	Mrs. Carol Cooper	Pictou
Assistant Director	Murray Hill	Pictou
Biologist	Ms. Nancy Adams	Pictou

Fisheries Technician	Al MacNeil	Pictou
Aquaculture Co-ordinator	Dr. Catherine Enright	Halifax
Aquaculture Administrator	Clarrie MacKinnon	Halifax
Legal Services Technician	Ms. Kim Lipsett	Halifax
Biologist	Andrew Bagnall	Ostrea Lake
Maintenance Worker	Ray Truen	Ostrea Lake
Hatchery Manager	Don MacLean	Fraser's Mills
Fisheries Technician	Jim MacDonald	Fraser's Mills
Hatchery Technician	Darryl Murrant	Fraser's Mills
Hatchery Technician	Frank MacDonald	Fraser's Mills
Hatchery Manager	Mike McNeil	McGowan Lake
Hatchery Technician	Ms. Carolyn Holdright	McGowan Lake
Hatchery Technician	Bill Whitman	McGowan Lake

Industrial Development Division

Director	George Richard	Halifax
Secretary to the Director	Ms. Doreen Jollimore	Halifax
Program Administrative Officer	Dave Hansen	Halifax
Incentive Programs Assistant	Ms. Linda Riles	Halifax
Fisheries Inspector	Ms. Mary Meagher	Halifax
Fisheries Inspector	Dana Rodgers	Halifax
Fisheries Inspector	Tom LeBlanc	Pictou
Fisheries Technician	Ole Egilsson	Pictou
Supervisor, Plants and Facilities	Gary Scott	Halifax
Construction Supervisor	Bill MacDonald	Halifax
Port Facilities Engineer	Marshall Giles	Halifax
Supervisor, Product Technology	Mike Drebot	Halifax

Nova Scotia Fisheries Loan Board

Executive-Director	John Marsters	Halifax
Manager, Fisheries Loans	Mack MacIntosh	Halifax
Secretary	Miss Nancy Corkum	Halifax
Clerk Typist	Mrs. Rita Jardine	Halifax
Stenographer	Mrs. Donna Stitt	Halifax
Chief Accountant	Mac Everett	Halifax
Accounting and Insurance Clerk	Mrs. Linda Fraser	Halifax
Accounting Clerk	Mrs. Barb Tribble	Halifax
Senior Loan Officer	Jim Sarty	Halifax
Loan Officer	Bruce Cox	Halifax
Loan Officer	Ms. Lorraine Provender	Halifax
Engineer	Mike Myketyn	Halifax
Fishing Vessel Inspector	Bernard Stockley	Halifax
Fishing Vessel Inspector	Bill Buffett	Halifax
Fishing Vessel Inspector	Tom Prewett	Halifax
Loans Administrator	Sonny Pellerin	Halifax

Training and Field Services Division**Training**

Director	Jim McLevey	Halifax
Secretary to the Director	Mrs. Barbara O'Brien	Halifax
Supervisor, Fisheries Training Centre	Don Robertson	Pictou
Chief Clerk	Mrs. Margarie O'Toole	Pictou
Instructor (Navigation)	Greg MacNeil	Pictou
Instructor (Navigation/M.E.D.)	Brad MacCallum	Pictou
Instructor (Engines/M.E.D.)	Ira Grant	Pictou
Instructor (Engines)	Ira Grant	Pictou
Instructor (Engines)	Gilles Gauthier	Pictou
Instructor (Business/M.E.D.)	Miss Beulah Wright	Pictou
Instructor (Nets and Gear)	Allan Tobey	Pictou
Maintenance Worker	Ed Dalton	Pictou
Chief Cook	Mrs. Alexina MacKay	Pictou
Housekeeping Aid	Mrs. Lois Betts	Pictou

Field Services

Supervisor, Field Operations	Cecil Rankin	Pictou
Fisheries Representative	Aldophe Kehoe	Petit de Grat
Fisheries Representative	Gerald Boudreau	Little Dover
Supervisor, Field Operations	Gerry Mossman	Rose Bay
Fisheries Representative	Gabriel D'Entremont	Clark's Harbour
Fisheries Representative	Arnold Muise	Middle West Pubnico
Fisheries Representative	Richard McDormand	Granville Ferry